Stereo zoom microscope

OZL-46

OZL 463; OZL 464; OZL 465; OZL 466; OZL 467; OZL 468



PROFESSIONAL MEASURING

English version

Operating instructions Stereo zoom microscope

Version 1.3
2026-01
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English

KERN Optics OZL-46

Stereo zoom microscope

Operating instructions Stereo zoom microscope

Version 1.3 2026-01 English

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1 Technical data

Kern model	OZL 463	OZL 465	OZL 467
Item number/type	OZL 463	OZL 465	OZL 467
Dimensions (WxDxH)	300x240x420 mm		
Tube type	Binocular		
Optical system	Greenough		
Field of view mm	Ø 28.6 – 4.4		
Objective zoom	0.7x – 4.5x		
Stand	Pillar Stand	Pillar Stand	Mechanical
Eyepiece Field of view	HWF		
Illuminance Transmitted light / reflected light	1W / 1W		
Type of illumination Transmitted light / reflected light	LED		
Illumination device	Transmitted light Incident light		
Input voltage Power supply / Current [Max]	100 – 240V		
Input voltage device / current [max]	100 – 240V		
Plug-in power supply type	Built-in power supply		
Focusing mechanism	Coarse drive		
Packaging dimensions	460x410x300 mm		
Net weight	4.5 kg		
Gross weight	6 kg		

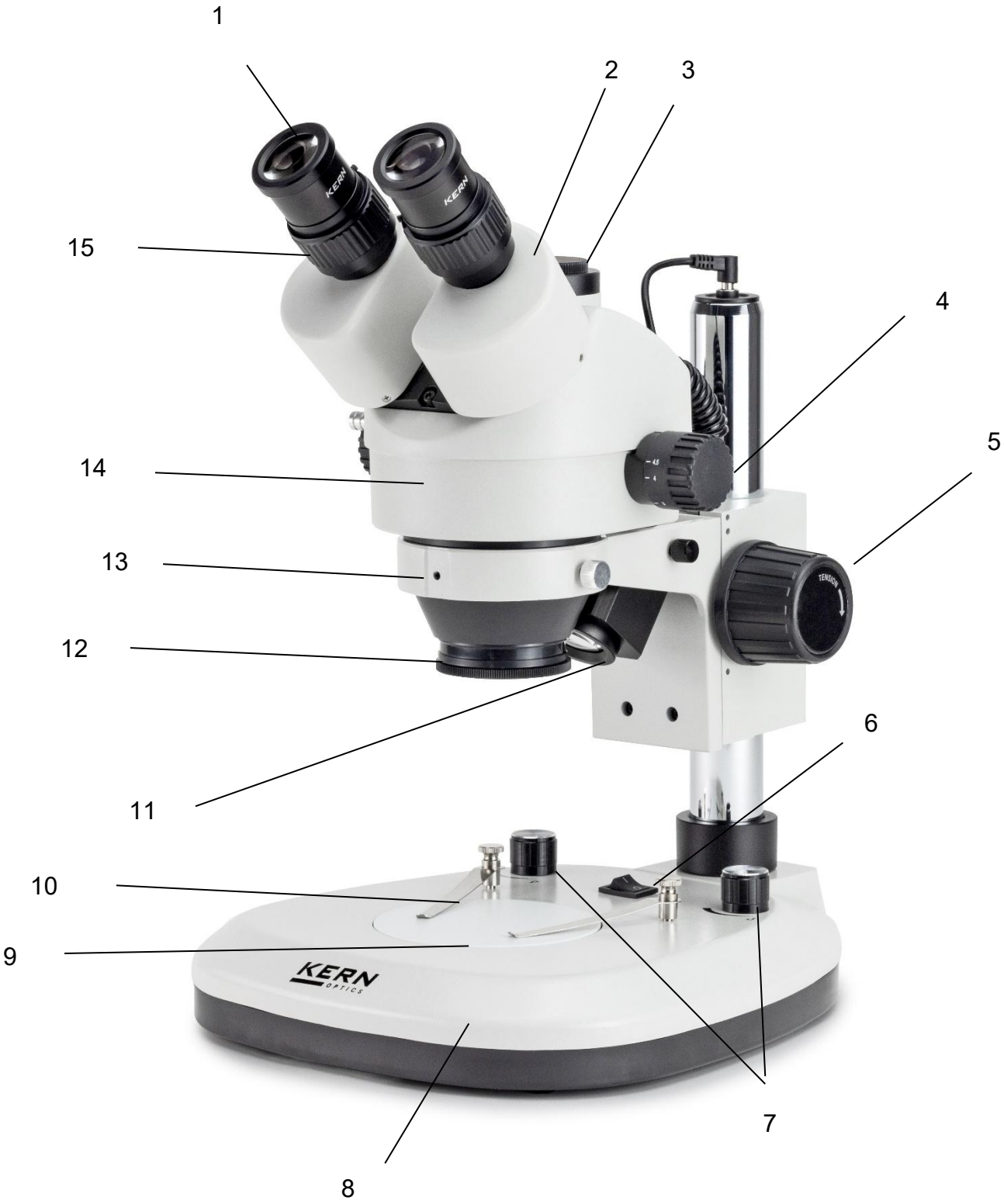
Kern model	OZL 464	OZL 466	OZL 468
Item number/type	TOZL 464-A	TOZL 466-A	TOZL 468-A
Dimensions (WxDxH)	300x240x420 mm		
Tube type	Trinocular		
Optical system	Greenough		
Field of view mm	Ø 28.6 – 4.4		
Objective zoom	0.7x – 4.5x		
Stand	Pillar Stand	Pillar Stand	Mechanical
Eyepiece Field of view	HWF		
Illuminance Transmitted light / reflected light	1W / 1W		
Illumination type Transmitted light / reflected light	LED		
Illumination device	Transmitted light Incident light		
Input voltage Power supply / Current [Max]	100 – 240V		
Input voltage device / current [max]	100 – 240V		
Plug-in power supply type	Built-in power supply		
Focusing mechanism	Coarse drive		
Packaging dimensions	460x410x300 mm		
Net weight	4.5 kg		
Gross weight	7 kg		

2 Declaration of conformity

The current EC/EU declaration of conformity can be found online at:
https://www.kern-sohn.com/shop/de/DOWNLOADS/

3 Overview of the device

3.1 Nomenclature (using the example of OZL 464)



	Description
1	Eyepieces
2	Prism housing
3	Camera adapter connection (Trinocular tube for C-mount)
4	Zoom control wheel
5	Focus wheel
6	Main switch
7	Brightness control for lighting units
8	Microscope stand
9	Stand Inlay (transmitted light unit fitted underneath)
10	Object holder
11	Reflected light illumination
12	Objectives
13	Microscope holder
14	Microscope head / tube
15	Diopter adjustment ring

4 Before use

4.1 General

The packaging must be opened carefully to prevent the accessories inside from falling onto the floor and breaking.

In general, a microscope should always be handled with great care, as it is a sensitive precision instrument. It is therefore particularly important to avoid sudden movements during operation or transport, especially in order not to damage the optical components.
You should also avoid dirt or fingerprints on the lens surfaces, as this will impair image sharpness in most cases.

To maintain the performance of the microscope, it must never be disassembled. Components such as objective lenses and other optical components should therefore be left as they were at the start of operation.

5 Basic information (general)

5.1 General information on warning notices

This operating manual uses warning notices to alert you to possible personal injury or property damage in certain situations.

Signal word	Description
DANGER	Failure to observe this warning will result in serious injury, permanent disability (e.g., loss of a limb), or death of the user or third parties.
WARNING	Failure to observe this warning may result in serious injury, permanent disability (e.g., loss of a limb), or death of the user or third parties.
CAUTION	Failure to observe this warning may result in minor injury or temporary impairment to the user or third parties (e.g., minor cuts).
NOTE	Failure to observe this warning may result in property damage.

Symbols in warning notices :

Symbol	Meaning
Warning signs	Warning signs warn you of hazards that could potentially cause personal injury. The symbol indicates the type of hazard.
	Indicates general hazards or a hazardous location
	Warning of electrical voltage
	Warning of optical radiation
	Warning of explosive substances
	Indicates electrostatic sensitive equipment

Symbol	Meaning
Commandment sign	Mandatory signs prescribe measures that you must take to prevent personal injury or property damage. The symbol indicates the necessary actions or items to prevent damage.
	Indicates a prescribed action

5.2 Intended use

The OZL 46 is used specifically for analyzing specimens with a focus on spatial impression (depth, thickness), e.g., insects, seeds, circuit boards, components.

5.3 Improper use

Do not use the device in potentially explosive areas or for measurements in liquids or on live parts.
Unauthorized structural modifications, additions, and conversions to the device are prohibited.

5.4 Warranty

The guarantee expires in the event of

- failure to observe our specifications in the operating instructions
- use outside the described applications
- Modification or opening of the device
- Mechanical damage and damage caused by media, liquids, natural wear and tear
- Improper installation or electrical installation
- Improper assembly or electrical installation

6 Basic warnings and safety instructions

6.1 Observe the instructions in the operating manual



Read the operating instructions carefully before commissioning/using the device, even if you already have experience with KERN devices. Always keep the instructions in the immediate vicinity of the device.

6.2 Staff training

The device may only be used by persons who have read and understood the operating instructions, in particular the chapter on safety.

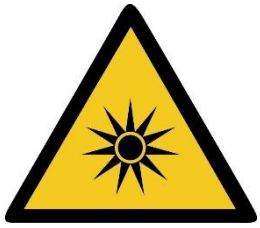
6.3 Safety

⚠ WARNING	
	**Read all safety instructions and directions.** Failure to follow the safety instructions and directions may result in electric shock, fire, and/or serious injury**.** **Keep all safety instructions and instructions for future reference.** ● The design of the device must not be modified. This can lead to incorrect measurement results, safety deficiencies, and destruction of the device. ● Do not operate the device in rooms or areas where there is a risk of explosion, and do not set it up there. ● Do not operate the device in a corrosive atmosphere. ● Do not immerse the device in water. Ensure that no liquids penetrate the interior of the device. The device may only be used in a dry environment and under no circumstances in rain or at a relative humidity above the operating conditions. ● Protect the device from prolonged direct sunlight. ● Do not expose the device to strong vibrations. ● Do not remove any safety signs, stickers, or labels from the device. Keep all safety signs, stickers, and labels in a legible condition. ● Do not open the device. ● The lamp generates a great deal of heat during operation. Avoid touching the lamp housing during operation and for some time afterwards. ● Do not operate the device in a corrosive atmosphere.

⚠ WARNING	
	**There is a risk of injury from electric shock!** ● Risk of short circuit due to liquids entering the housing! ● Do not immerse the device and accessories in water. Ensure that no water or other liquids enter the housing. ● Work on electrical components may only be carried out by an authorized specialist company! ● Take care not to twist or kink the power cord. ● Only use the original adapter supplied.

⚠ WARNING	
	**Choking hazard!** Do not leave the packaging material lying around carelessly. It could become a dangerous toy for children. ● The device is not a toy and should be kept out of the reach of children. ● This device can be dangerous if used improperly or for purposes other than those intended by untrained persons! Observe the personnel qualifications!

⚠ WARNING	
	**Electrostatically sensitive device!** ● The device can be destroyed by electrostatic discharge. Connectors for RF signals are particularly at risk. ● Please observe the handling instructions for components that are susceptible to electrostatic discharge.

⚠ WARNING	
	**There is a risk from optical radiation!** Gas discharge lamps, LED lights and other white light sources generate intense optical radiation, including UV (ultraviolet), visible light (VIS) and IR (infrared). This radiation can cause both skin and eye damage. The extent of the damage is determined by the wavelength, the duration of exposure and the operating mode (continuous or pulsed). ● Do not expose eyes and skin to radiation. ● Do not insert any reflective objects into the beam entrance. ● If necessary, use suitable protective equipment/protective clothing. ● Never remove the cover or cladding during operation

CAUTION
Keep a sufficient distance from heat sources. Do not use the device in environments with high humidity or water mist.

NOTE

● To avoid damage to the device, do not expose it to extreme temperatures, extreme humidity, or moisture.
● Do not use harsh cleaners, abrasives, or solvents to clean the device.

7 Transport and storage

7.1 Note

If you store or transport the device improperly, the device may be damaged. Observe the information on transporting and storing the appliance.

7.2 Transport

We recommend using the original packaging for shipping, transporting, or storing the microscope components. To prevent damage from vibrations, all movable parts that can be assembled and disassembled must be packed separately.

7.3 Storage

Avoid exposing the device to direct sunlight, high or low temperatures, shocks, dust, and high humidity.

The suitable temperature range is 0 - 40 °C and a relative humidity of 85% should not be exceeded.

The appliance should always be placed on a firm, smooth and horizontal surface.

When the microscope is not in use, it is best to cover it with the dust cover supplied.

Dust or dirt inside the optics of a microscope can in many cases lead to irreversible malfunctions or damage.

Accessories consisting of optical elements, such as additional lenses, are preferably stored in a drying box with desiccant.

7.4 Packaging/return transport

Returns are only possible within the limits of the general terms and conditions. Keep all parts of the original packaging for any necessary return transport.

- Only the original packaging may be used for return transport.
- Before shipping, disconnect all connected cables and loose/movable parts.
- Reattach any transport locks that may have been provided.
- Secure all parts against slipping and damage.

8 Unpacking and commissioning

8.1 Unpacking

In the event of a return, please note the information in the chapter "Packaging/Return Transport."

On receipt of the device, you should first check that no damage has occurred during transportation, that the outer packaging, the housing, other parts or even the device itself have not been damaged. If any damage is evident, please notify KERN GmbH immediately.

8.2 Initial commissioning

To ensure that the microscope functions properly, it must be assembled as described in the chapter "9 ."

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9 Assembly

The first step is to place the **microscope stand on a firm and level surface**.

For devices with pillar stand the holder (OZL 463, OZL 464, OZL 465, OZL 466) is already on pillar of the stand, but you must always check whether it is **fixed** securely and that it is in the **correct position** (preferably centrally and facing to the front).
For further details on adjusting the stand, see 10.5 .
The next step is to place the **microscope head on the holder**, by passing the objective through the holder ring until the rest of the head is above the ring.

You must use the small silver adjusting screw on the front of the holder ring to **fix the head** in place.
The alignment of the microscope head is left to the user to do and can be adjusted to suit the individual application situations.
To make it easier to operate the focus wheels or lighting control for example, we recommend that you position the head with the tube connectors centrally to the front.
Ideally, the holder and head are then parallel on the central axis of the stand base *(see3.1)*.

Then you can remove the protective caps from the tube connectors so that you can then **fit the eyepieces**. When doing this, please be particularly careful that you do **not touch the optical lenses with your fingers** and that no dust enters the apertures.
You should also **never fit two eyepieces with different magnifications**.

With regard to the use of **transmitted light illumination** you must make sure that the **frosted glass stand insert is fitted in the centre of the stand base**, so that the transmitted light can be used correctly.

Also, when using reflected light (for OZL 463, OZL 464, OZL 467, OZL 468) please make sure, that the according light unit is mounted to the underside of the holder and the **connection cable between the holder and upper side of the pillar is plugged in** *(see 3.1)*.

Additional optional accessories:

- The eye cups supplied with the microscopes can be fitted to the eyepieces.
- You can fit a C-mount adapter to the appropriate connection point on the top of the microscope head for trinocular devices (OZL 464, OZL 466, OZL 468). This enables you to fit and use digital cameras

10 Operation and functionality

10.1 First steps

After assembly, if the microscope is ready for use, then you must first establish a **power connection** using the cable which is connected to the device.
Further details on adjusting the illumination can be found in section 10.7.

For connecting a camera to trinocular devices (OZL 464, OZL 466, OZL 468), please refer to *Chapter 10.9 (Fitting and adjusting a camera)."*

Do not forget to remove the cap from the bottom of the objective, so that you will then be able to see a reflection of the object being observed in the eyepiece.

All important functions which relate to the use of the devices in this document are described in the following sections.

10.2 Adjusting the interpupillary distance

Different users have different interpupillary distances. So each time a different person uses the microscope, the gap between the two eyepieces must be re-adjusted.
While you are looking through the eyepieces, use one hand to hold the righthand or lefthand prism housing firmly.
By rotating outwards or inwards, you can either increase or reduce the interpupillary distance.
As soon as the lefthand and righthand visual fields exactly overlap each other, this is the correct interpupillary distance.

10.3 Adjustment the magnification

As the KERN OZL-46 series are stereo zoom microscopes, then you adjust the magnification using the two zoom adjustment wheels on the lefthand and righthand side of the microscope head.
In the trinocular devices (OZL 464, OZL 466, OZL 468), the click-stop on the zoom wheel ensures precise snapping into the magnification levels and thus allows simple, reproducible adjustment of defined magnifications – particularly advantageous when using the camera and for measurements, as the correct magnification level is always ensured.

10.4 Diopter adjustment and focusing

A special feature of stereo microscopes is that they are fitted with an optical unit which has a relatively high depth of field. In order to be able get the most benefit from this feature, each user must synchronise the focussing mechanisms for themselves.

The steps to do this are described in the following section.

1. Place the object to be observed on the working surface under the objetive.
2. Put both dioptre adjustment rings into the starting position of 0.
3. Use the zoom control dials to set the smallest possible magnification.
4. Look through the right eyepiece with the right eye and bring the object into focus by using the focus control dials.
5. Now set the largest possible zoom factor.
6. Once again, still only looking through the right eyepiece, bring the object into focus
7. Then set the smallest possible zoom factor again.
8. If the object then does not appear to be in focus, adjust the focus on the dioptre adjustment ring of the right eyepiece.
9. In order to get the highest level of accuracy when adjusting the focus, you should repeat steps 5-8.
10. Afterwards set back to the smallest possible zoom factor.
11. Then look through the left eyepiece with the left eye and use the lefthand dioptre adjustment ring to also adjust the optimum focus of the object.

In this way, the object being observed will be in focus at any zoom setting

10.5 Adjusting the stand

Torque of the focus wheels

You adjust the torque of the focus wheels by holding one of the two wheels in place and using the other hand to turn the other wheel.
Depending on the direction of the turn, the torque will be increased or decreased.
On one hand, this function can help to make it easier to adjust the focus and on the other hand it can prevent the microscope head from slipping down unintentionally. In this way you can avoid possible damage which could occur if the objective lens and the object being observed should collide.

Height adjustment

With a stereo microscope on a **pillar stand** (OZL 463, OZL 464, OZL 465, OZL 466), the microscope head can be height adjusted using the focus wheels and in addition, the microscope holder can be fixed at any point on the pillar, depending on the application requirements.

The way to fix the position is to use an adjusting screw, which is located directly on the back of the holder.

For devices with **mechanical stand** (OZL 467, OZL 468) this function is not available. Only with help of the focus wheels you can adjust the height setting of the microscope head

10.6 Use of eyecups / high eye point eyepieces

The eye cups supplied with the microscope can basically be used at all times, as they screen out intrusive light, which is reflected from light sources from the environment onto the eyepiece, and the result is better image quality.

But primarily, if eyepieces with a high eye point (particularly suitable for those who wear glasses) are used, then it may also be useful for users who don't wear glasses, to fit the eye cups to the eyepieces.

These special eyepieces are also called High Eye Point eyepieces. They can be identified by the glasses symbol on the side. They are also marked in the item description by an additional "H" (example: HSWF 10x Ø 23 mm).

When fitting the eye cups, make sure that the dioptre setting is not moved. We would therefore advise that you hold the dioptre adjustment ring on an eyepiece with one hand while you fit the eye cup with the other.

Before using the microscope, users who wear glasses must remove the eye cups, which you may find on High Eye Point eyepieces.

As the eye cups are made of rubber, you must be aware that when you are using them, they can become slightly dirty through grease residues. In order to maintain hygiene, we would therefore recommend that you clean the eye cups regularly (e.g. with a damp cloth).



Eyecups



High Eye Point Eyepiece
(recognizable by the eyeglass symbol)

10.7 Lighting control

The microscopes in the OZL-46 series have an adjustable reflected and transmitted light illumination.
The power supply is guaranteed by connecting the mains cable and pressing the main switch on the central rear section of the stand base.

The control knob to the right of the main switch is responsible for the adjustment of the light intensity of the transmitted illumination.

The same functions belong to the control knob to the left of the main switch according to the reflected illumination. For devices with integrated ring illumination (OZL 465, OZL 466) this control element is located at the front of the objective housing.

10.8 Using external illumination units

If, when using a microscope in its standard version, the lighting is not suitable for the application, then it often makes sense to fit an external lighting unit to overcome this problem.

The lighting units which are suitable for devices of the OZL-46 series, are goose neck lighting units *(see figure)*. These are available as LED as well as halogen versions and also have an on/off switch or different controller.



Typical goose neck lighting

<u>Using goose neck lighting unit</u>

Depending on the requirements, a goose neck lighting unit is placed next to, in front of or behind the microscope. For halogen lighting units, the light source is in the housing of the unit and is emitted through one or several optical fibre cables. For LED units, on the other hand, it us usually at the end of the cable.
These cables are flexible and therefore offer a large number of positioning options, so that the object being observed is perfectly illuminated.

10.9 Fitting and adjusting a camera (OZL 464, OZL 466, OZL 468)

Special microscope cameras can be connected to the trinocular devices of the OZL-46 series to digitally document images or sequences of an observation object.

The connection for this is located on the top of the microscope head.

To fit a microscope camera properly, you must use an adapter with a C-mount thread, which needs to be attached to the camera connection point.

In total there are three focusable adapters to choose from *(see figure below)*. The difference between these adapters is that they have different integrated magnification (0.3x, 0.5x, 1.0x).
The camera and adapter are then united using the C-mount thread.



C-mount adapter

The image which is shown on the camera connected to the device can often have a different level of focus compared with the image on the eyepiece. In order to be able to bring both images into focus, **the focus can be adjusted by those adapters when turning the attached black plastic ring.**

10.10 Using additional accessories

Auxiliary objectives



In order to make the magnification series of one of the stereo zoom microscopes described here even more flexible, there is the option of using appropriate auxiliary objectives.
You can choose from four different achromatic corrected objectives (0.5x, 0.75x, 1.5x, 2.0x), depending on what is required.

You can fit these objectives by simply screwing them onto the thread of the objective housing which is located at the bottom of the microscope head.
When you are doing this, you must avoid touching the objective lenses with your fingers or leaving any dust between the standard objective and the auxiliary objective.

10.11 Changing the bulb

LED

The devices in the OZL-46 range with lighting are all fitted with LED bulbs.
Due to the long service life of an LED lighting system, for these microscopes it will not be necessary to simply change a bulb.
Problems with the lighting unit would therefore, in most cases, be caused by defects in the electrical system. If this is the case, then our Technical Service will be able to help.

11 Troubleshooting

Problem	Possible causes
Lamp does not light	Power plug not properly inserted
	No power at the outlet
	Lamp defective
	Fuse defective
Lamp burns out immediately	The specified lamp or fuse is not being used
Brightness cannot be adjusted	The brightness control is set incorrectly
The field of vision of one eye does not match that of the other eye	The interpupillary distance is not set correctly
	The diopter setting has not been adjusted correctly
	Different eyepieces are used for the right and left eyes
	The eyes are not accustomed to using a microscope
Dirt appears in the field of view The image is unclear	There is dirt on the object being observed
	Dirt is on the eyepiece surface
	Dirt is on the objective lens surface
Dirt or dust in the field of view	Dirt/dust on the eyepieces
	Dirt/dust on the front lens of the condenser
	Dirt/dust on the object
The focus wheels are blocked	The torque of the focus wheels is set too high
The microscope head slips down during viewing	The torque of the focus wheels is set too low
The eyes tire easily	The diopter compensation is incorrect
	The brightness setting is incorrect

12 Service

If, after reading this operating manual, you still have questions about commissioning or operation, or if, contrary to expectations, a problem occurs, please contact your specialist dealer. The device may only be opened by trained service technicians authorized by KERN.

13 Power supply

13.1 Mains connection



The microscope may only be connected to the mains power supply if the information on the microscope (sticker) and the local mains voltage are identical.



Important:

- Check the power cord for damage before use
- Ensure that the power supply unit does not come into contact with liquids
- The main plug must be accessible at all times.

14 Maintenance, servicing and disposal



Disconnect the device from the power supply before performing any maintenance, cleaning, or repair work.

14.1 Cleaning

The appliance must always be kept clean and regularly freed from dust.
Before wiping the appliance when it gets wet, make sure that the power is switched off.

Glass components should preferably be wiped lightly with a lint-free cloth if they become dirty.

To wipe oil stains or fingerprints from lens surfaces, the lint-free cloth is moistened with a mixture of ether and alcohol (70/30 ratio) and then cleaned

Ether and alcohol must always be handled with care as they are highly flammable substances. It is therefore essential to keep them away from naked flames and electrical appliances that are switched on and off and only use them in well-ventilated rooms.

However, organic solutions of this type should not be used to clean other components of the appliance. This could cause changes to the paintwork. It is sufficient to use a neutral cleaning agent for this purpose.

Other cleaning agents for the optical components include

- Special cleaner for optical lenses
- Special optical cleaning cloths
- Bellows
- Brush

If handled correctly and checked regularly, the microscope will function smoothly for many years.

14.2 Maintenance and repair

Do not make any changes to the device or install any replacement parts. Contact the manufacturer for repairs or device inspections.

14.3 Disposal



Old devices and accessories must not be disposed of with household waste.

The operator must dispose of the packaging and the device in accordance with the applicable national or regional regulations at the place of use. The device consists of various components and materials, such as:

- Electronic components (circuit boards, electrical cables
- Plastic (housing)
- Metal

Improper disposal of the device can have harmful effects on humans and the environment.

Proper and environmentally friendly disposal can prevent harmful effects and recover raw materials.

15 Further information

The illustrations may differ slightly from the actual product.

The descriptions and illustrations in this user manual are subject to change without notice. Further developments to the device may result in such changes..



All language versions contain a non-binding translation. The original German document is binding.